APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,746	12/28/2001	Guy L. Steele JR.	06502.0371-00000	4057

	EXAMINER
7590 09/22/2004	MAI, TAN V

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ART UNIT	PAPER NUMBER
2124	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/035,746	STEELE, GUY L.
	Examiner	**Art Unit**
	Tan V Mai	2124

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>3/27, 4/26 & 11/9/02, 1/15/03</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-71</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) <u>1-28</u> is/are allowed.

6)☒ Claim(s) <u>29-71</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/27 & 11/19/02 , 1/15/03</u>

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

1.   The disclosure is objected to because of the following informalities:

In the specification, pages 1 and 9; the status of Co-pending Application(s) Serial

No. _____ is required to be kept current.

Appropriate correction is required.

2.   Claims 29-71 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

As per independent claim 29, the term "the floating point operand" (penultimate

line) should be --the first floating point operand--. Similarly noted claim 59.

3.   The nonstatutory double patenting rejection is based on a judicially created
doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the
unjustified or improper timewise extension of the "right to exclude" granted by a patent
and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11
F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ
645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In
re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d
528, 163 USPQ 644 (CCPA 1969).

> A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome
> an actual or provisional rejection based on a nonstatutory double patenting ground provided the
> conflicting application or patent is shown to be commonly owned with this application. See 37
> CFR 1.130(b).
> Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer.
> A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 29, 31, 59 and 60 are provisionally rejected under the judicially created

doctrine of obviousness-type double patenting as being unpatentable over claims 11-12,

14, 17-18 and 20, respectively, of copending Application No. 10/035,586. Although the

conflicting claims are not identical, they are not patentably distinct from each other because the **"first** floating point **operand** <u>and</u> a **second** floating point **operand"** [of instant application] is same as the **"plurality** of floating point **operands"** [of Application No. 10/035,586] when "plurality" equals **2**. It is also noted that the preambles recite different features, i.e., max/min vs. comparing; however, the bodies only recite comparing features.

Claims 29, 31-34, 59 and 60 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15, 17-20, 26 and 28, respectively of copending Application No. 10/028,375. Although the conflicting claims are not identical, they are not patentably distinct from each other because the bodies only recite comparing features.

This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 29-58 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims recite a method for performing a mathematical function. The claimed invention comprises a plurality of mental steps whereby the claimed mental steps are

non-statutory subject matter. Specifically, the claimed method steps can be practiced mentally in conjunction with pen and paper.

However, in order for such a claimed computer-related process to be statutory, the method claims must include either a step that results: (1) in a physical transformation outside the computer, (2) in a limitation to a practical application, or (3) performed specific machine/element(s). Accordingly, claims 29-58 are clearly directed to a non-statutory process.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 29-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Orup.

As per claims 29-30, Orup discloses, e.g., see **Figs. 5-6** & "SUMMARY OF THE INVENTION", the invention, **floating point NaN comparator**, substantially as claimed, including: **transform first input operand (602), transform second input operand (604), compare first input to second input (606) and select first or second input based upon comparison (608)**. It is noted that Orup does not specifically detail the claimed "determining a <u>format</u> of the first / second floating point operand based upon floating point status information encoded within the first / second floating point operand"

feature. However, Orup does disclose "FPU core 94 may use the **tag value** ... Types of special floating point numbers include zero, + infinity, -infinity, and NaNs. By including one bit for each type of special floating point number, <u>FPU core 94 can determine which type of special floating point number the operand represents with minimal decoding</u>" (col. 16, first complete paragraph). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to design the claimed invention according to Orup's teachings, i.e., including the "**tag value**" in **floating point NaN comparator,** because the proposed device is a **floating point comparator** having "determine a format" as claimed.

As per dependent claim 31, the claim adds the "group of format". Orup discloses the feature, e.g., see col. 2, second complete paragraph.

As per dependent claim 32, the claim adds the "positive overflow" and "negative overflow" formats. These features are well known formats in special floating point number.

As per dependent claim 33, the claim adds the "positive underflow" and "negative underflow" formats. These features are well known formats in special floating point number.

As per dependent claim 34, the claim adds the "positive infinity" and "negative infinity" formats. These features are well known formats in special floating point number.

As per dependent claims 35-58, the claim adds the details of the result signal. These features are obvious design choice.

Due to the similarity of claims 59-71 to claims 29-58, they are rejected under a similar rationale.

7.   Claims 29-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al (Applicant's admission Prior Art).

As per independent claim 29, Huang et al disclose, e.g., see **Fig. 4**, the invention, **arithmetic calculation circuit (100),** substantially as claimed, including: **X and Y operand registers 116 & 118; arithmetic section 114 and special operand generator 122**. It is noted that Huang et al do not specifically detail the claimed "determining a <u>format</u> of the first / second floating point operand based upon floating point status information encoded within the first / second floating point operand". However, Huang et al do disclose X and Y operand registers each incudes a special operand indicator which is stored a special operand of a predetermine set of special operands.   Therefore, the Huang et al's feature is equivalent to the claimed "determining a <u>format</u>...". It would have been obvious to a person having ordinary skill in the art at the time the invention was made to design the claimed invention according to Huang et al's teachings because the device is an **arithmetic calculation circuit (100)** having special operand indicator in each operand register as claimed.

As per dependent claim 30, the claim adds "at least one control signal that cause the result to indicate..." Huang et al's arithmetic calculation circuit could provide the "comparing" result as claimed.

As per dependent claim 31, the claim adds the "group of format". Huang et al disclose the feature, e.g., claim 3.

As per dependent claim 32, the claim adds the "positive overflow" and "negative overflow" formats. These features are well known formats in special floating point number.

As per dependent claim 33, the claim adds the "positive underflow" and "negative underflow" formats. These features are well known formats in special floating point number.

As per dependent claim 34, the claim adds the "positive infinity" and "negative infinity" formats. These features are well known formats in special floating point number.

As per dependent claims 35-58, the claim adds the details of the result signal. These features are obvious design choice.

Due to the similarity of claims 59-71 to claims 29-58, they are rejected under a similar rationale.

8.   Claims 29-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lynch et al (Applicant's admission Prior Art).

As per independent claim 29, Lynch et al disclose, e.g., see **Fig. 4**, the invention, **floating point unit (36)**, substantially as claimed, including: **Register Stack (84) and FPU Core (94)**. It is noted that Lynch et al do not specifically detail the claimed: (1) "providing <u>one of the **maximum** and the **minimum**</u> of a first floating point operand and a

second floating point operand" and (2) "determining a **format** ...based upon floating point status information encoded **within** the ... floating point operand". First, Lynch et al do disclose FPU (94) performs "floating point **operation**". Therefore, it would have been obvious to a person having ordinary skill in the art the FPU (94) is capable of providing "one of the **maximum** and the **minimum** of a first floating point operand and a second floating point operand" as claimed. Second, Lynch et al disclose "appends a tag value to each floating point number". Therefore, the combination of the stored floating point number with a tag value is considered the claimed "floating point status information encoded **within** the ... floating point operand". It would have been obvious to a person having ordinary skill in the art at the time the invention was made to design the claimed invention according to Lynch et al's teachings because the device is a **floating point unit (36)** having the combination of the floating point number with a tag value in each operand register as claimed.

As per dependent claim 30, the claim adds "at least one control signal that cause the result to indicate..." Lynch et al's arithmetic calculation circuit could provide the "comparing" result as claimed.

As per dependent claim 31, the claim adds the "group of format". Lynch et al disclose the feature, e.g., col. 2, second complete paragraph.

As per dependent claim 32, the claim adds the "positive overflow" and "negative overflow" formats. These features are well known formats in special floating point number.

As per dependent claim 33, the claim adds the "positive underflow" and "negative underflow" formats. These features are well known formats in special floating point number.

As per dependent claim 34, the claim adds the "positive infinity" and "negative infinity" formats. These features are well known formats in special floating point number.

As per dependent claims 35-58, the claim adds the details of the result signal. These features are obvious design choice.

Due to the similarity of claims 59-71 to claims 29-58, they are rejected under a similar rationale.

9.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cited references are art of interest.

10.   The following is an examiner's statement of reasons for allowance: the recorded references do NOT teach or suggest the "floating point max/min circuit" having the combination features, **first / second analysis circuit** and **decision circuit**, as recited in independent claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

11.　　Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tan V. Mai whose telephone number is (703) 305-9761. The examiner can normally be reached on Tue-Fri from 6:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki, can be reached on (703) 305-9662. The fax phone number for the organization where this application or proceeding is assigned are:

　　　　　　　Official　　　　　　　(703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

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TAN V. MAI
PRIMARY EXAMINER